

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Review of the Commission's Rules Regarding the Pricing	)	
of Unbundled Network Elements and the Resale of	)	WC Docket No. 03-173
Service by Incumbent Local Exchange Carriers	)	
	)	

**REPLY DECLARATION OF ROBERT D. WILLIG**

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**I. INTRODUCTION AND SUMMARY**

1. My name is Robert D. Willig. I am the same witness who submitted a declaration on behalf of AT&T Corp. ("AT&T") in the initial round of comments in this case.

2. AT&T has asked me to submit this reply declaration in response to the comments and supporting declarations submitted by the incumbent local telephone companies on December 16, 2003, regarding the economic principles that should govern the pricing of unbundled network elements ("UNEs") pursuant to section 252(d)(1) of the Telecommunications Act of 1996 ("1996 Act"). The incumbents suggest that the Commission should abandon its "TELRIC" pricing standard even if that would result in UNE rates well above the levels that would prevail in a fully contestable/competitive market. Kahn-Tardiff (Verizon) Decl. ¶ 32. I disagree. Even if the incumbents could identify some flaws with the calculation of TELRIC-based prices, it would be, in my view, an abdication of the Commission's public interest responsibilities to abandon that standard and allow the incumbents to charge rates that it knows will be in excess of efficient levels.

3. Rather, in light of the Commission's prior findings that TELRIC "replicates . . . the conditions of a competitive market" *Local Competition Order*, 11 FCC Rcd. ¶ 679 (1996))

provides carriers with incentive to make efficient investment decisions (*id.* ¶ 685), and directly promotes the pro-competitive purposes of the 1996 Act (*id.* ¶ 679) – findings that were upheld as reasonable by the Supreme Court in *Verizon Communications, Inc. v. FCC*, 535 U.S. 467 (2002) – the incumbents here should have a heavy burden of demonstrating with specificity that the Commission’s TELRIC standard will understate economic costs, identifying how their proposed standard addresses those shortcomings, and providing in operational detail the data and processes necessary to implement their proposed alternative standard. As I explain below, the incumbents do not even attempt such a showing. They instead ask the Commission to adopt a “reproduction cost” standard for UNE pricing. The Commission, however, has already rejected the reproduction cost standard, correctly observing that it is “essentially an embedded cost methodology” that would foreclose meaningful local competition and preserve the ability of the incumbents to earn supracompetitive profits. *Local Competition Order* ¶ 684. Nothing has occurred since 1996 to change the fundamental economics on which this conclusion was based.

4. To be sure, the incumbents (at times) suggest *ad hoc* adjustments from a “pure” reproduction cost standard. For upgrades or network changes that the incumbent self-reports it will expect to execute over some limited time frame, the incumbent would substitute its self-reported expected costs of these developments. Or, if old plant for which a reproduction cost is sought is no longer in production or would produce patently absurd cost estimates (*e.g.*, reproduction costs of existing analog switches), the incumbents propose some amorphous adjustments to render their standard more forward-looking. These proposed adjustments both concede the important point that existing incumbent networks cannot be presumed efficient and fail adequately to transform reproduction costs that are rife with inefficiency into efficiency-based forward looking economic costs.

5. If anything, recent regulatory developments make the use of reproduction costs even more inapposite for UNE pricing than in 1996. The network that the incumbents would reproduce, of course, is their existing network, which is built to provide a mix of services, such as broadband, local, and wireless. In the *Triennial Review Order*, 18 FCC Rcd. 16987 (2003), the Commission limited the rights of competitive carriers to gain access to the facilities and capabilities of this network. Most notably, the Commission held that competitive carriers cannot obtain access to the broadband capabilities of the large and growing number of loops that contain some fiber. In many instances, the incumbents have deployed this fiber, not because it is efficient for voice services, but to provide broadband services (which competitive carriers are not permitted to provide using those facilities). Thus, these “costs” are not caused by the competitive carriers’ purchase of narrowband UNEs, and it would be inefficiently discriminatory to “reproduce” (or, for that matter, to “replace”) the costs of these “existing” facilities in calculating UNE costs. The incumbent economists essentially concede this point. NERA (BellSouth) Decl. ¶ 40.

6. Given the well-known deficiencies of the reproduction cost standard, the incumbent economists attempt no meaningful theoretical defense of that standard. In fact, the incumbent economists concede that network element rates should not be set on the basis of “embedded” costs and should not include costs associated with past or existing inefficiencies. Instead, they contend that, in this context, reproduction cost is good enough. They contend that existing incumbent networks can be “presumed” to be “efficient” because of existing “price cap” regulation and “intermodal competition.” The incumbent economists, however, do not address the well-known deficiencies of price cap regulation that I discussed in my initial declaration, but merely repeat the simplistic notion that price caps, by breaking the express link between an

incumbent's costs and its rates, create *some* incentive for incumbents to operate efficiently. Ignoring the shortcomings in price cap regulation does not make them go away.

7. Indeed, a careful reading of the incumbents' expert testimony makes clear that the incumbent economists do not believe that the existing incumbent networks are optimally efficient. They expressly acknowledge that because of sunk investment decisions made in the past, the existing networks are not configured the way a new entrant would configure its network and employ technology that is inferior to what a new entrant would deploy. This is consistent with the very definition of *inefficiency*.

8. But whatever salutary effect price cap regulation has on incumbent investment decisions and network operation would be undone by the incumbents' proposed reproduction cost standard that would set UNE rates on their existing network design without reference to efficiency considerations. A reproduction cost standard would enable the incumbents to pass along to their competitors the full cost of the incumbents' investments (including a risk-adjusted return on capital) even if those investments are no longer efficient or were not even efficient when first made. As a result, this standard would threaten the nascent local competition that is now finally emerging nearly eight years after the 1996 Act was passed.

9. Having no theoretical justification for their reproduction costs standard, the incumbent economists launch a scattershot attack on LRIC-based pricing. Their central argument is that TELRIC cannot be "compensatory" in an environment where continued technological advancements consistently reduce the value of long-lived sunk assets. But as the incumbents' principal economist, Dr. Alfred Kahn, acknowledges in his declaration, this purported concern can be addressed fully by an appropriate return on capital and depreciation

lives that reflect this risk. And while the incumbent economists speculate that state commissions have failed to adopt appropriate values for these “inputs,” the hard evidence is to the contrary.

10. The incumbents also claim that the Commission’s TELRIC rules are internally inconsistent because they assume that the incumbent faces “multiple competitors” that drive rates to costs, yet base rates on the assumption that service is provided by a “single carrier” that operates an efficient network that is capable of serving all customer locations within a particular geographic area. The tension posited by the incumbents is illusory. The basic flaw in their reasoning is their confusion of the competitive market assumptions of LRIC-based pricing with the requirement that there be multiple, facilities-based competitors. Although it is, of course, correct that a market with numerous vigorously rivalrous firms will ordinarily be competitive, the existence of multiple competitors in a market is not a *necessary* condition for that outcome. Markets will also achieve competitive results when effectively *contestable*. “Using contestability theory, economists no longer need to assume that efficient outcomes occur only when there are large numbers of actively producing firms. What drives contestability is the possibility of costlessly reversible entry.” William J. Baumol, John C. Panzar and Robert D. Willig, *CONTESTABLE MARKETS AND THE THEORY OF INDUSTRY STRUCTURE* xiii (rev. ed. 1988) (emphasis added). To be sure, the incumbent economists are correct to the extent that they are contending that LRIC-based pricing of UNEs is “counterfactual”; local telecommunications markets are not contestable, but instead are protected by steep entry barriers. But it is precisely because competitive forces are insufficient to constrain incumbent market power that rate regulation is necessary to replicate the workings of contestable/competitive markets.

11. Nor is it true that the proposed reproduction cost standard can be expected to be implemented more accurately than TELRIC. The record testimony is that the incumbents’ plant

records are notoriously unreliable. In the case of the incumbents' "hard-wired" central office equipment, for example, the Commission staff determined recently that the incumbents' books contain substantial "phantom" assets, amounting to almost 20 percent of the account totals, suggesting that records on other plant may also be unreliable. The incumbent carriers' outside plant records reflect outdated cable routes and/or cable descriptions, and include redundant or duplicate plant. Worse yet, because the incumbents are the only parties that have access to the data that would be used to construct the reproduction costs of the existing networks, the incumbents would have powerful incentives to manipulate that information to their advantage.

12. In contrast, TELRIC-based rates are based on objective standards that do not give the incumbents an informational advantage. Further, contrary to the suggestions that TELRIC ignores relevant "real world" constraints, such as the location of customers and physical barriers, current TELRIC models expressly take these factors into account (and do so with increasing sophistication through use of geocoded data).

13. Finally, the incumbents again acknowledge that appropriately forward-looking capital costs ensure that TELRIC is fully compensatory, but argue that they are entitled to a premium above the risk-adjusted cost of capital ordinarily determined using standard methods for determining return on investment. There are, however, two general conceptual flaws in the incumbents' proposals. First, the incumbents erroneously claim that the incumbents' own cost of capital is irrelevant and that the relevant "proxy" group of firms for estimating the cost of capital is either firms in the S&P 500, competitive local carriers or long distance carriers. This is wrong because the cost of capital should be based on firms that at least provision UNEs, not firms that face risk totally unrelated to leasing access to UNEs at wholesale and that face radically different risks. Further, contrary to the incumbents' claims, the relevant cost of capital is not that of an

efficient firm that specializes in the provision of only UNEs. An efficient provider of UNEs would take advantage of the efficiencies related to the economies of scope associated with the provision of UNEs. To the extent the incumbents argue that their additional lines of business lower overall risk, the efficient UNE provider would be integrated with a firm that engages in such businesses too. The only proxy group for which public data are available that satisfies these principles is the proxy group of the regional Bell operating companies.

14. Second, the incumbents are wrong in claiming that any cost of capital estimates should be “grossed up” to account for various types of risks and forgone options. As an initial matter, to the extent that the incumbents are discussing risks and options associated with past investment, the “costs” of those risks and options are not attributable to the demands of current UNE purchasers. This is particularly true now given that much of the incumbents’ current investment is for facilities that are (in whole or in part) unavailable to competitive carriers on an unbundled basis.

15. In any event, to the extent these risks and options are relevant to the UNEs that incumbents are providing today, the methodologies widely used to determine TELRIC capital costs are based on the expectations of financial markets, which reflect such risks. Moreover, certain of the purported “risks” identified by the Bells, such as “lease cancellation” risk, may actually be “upside” risks, which, if separately incorporated into the cost of capital, would produce a *lower* cost figure. Thus, none of the incumbents’ proposed “additors” are warranted.

## **II. THE REPRODUCTION COST STANDARD PROPOSED BY THE INCUMBENT ECONOMISTS FOR UNE PRICING IS ILLEGITIMATE AND UNWORKABLE.**

16. After eight years of attacks by the incumbent local carriers on the TELRIC standard, the initial comments filed by the incumbent carriers in this proceeding provide a

moment of truth. The incumbents' alternative to TELRIC is an empty box. What the incumbents ask the Commission to adopt instead of TELRIC is the standard of reproduction cost: the cost of building and operating, at today's prices, the hodgepodge of legacy assets—whether up-to-date or obsolete, efficient or inefficient, attributable to UNEs or not—that the incumbents happen to have in the ground today. It is difficult to imagine a cost standard that has less to do with true forward-looking economic costs, and which is more clearly illegitimate.

17. As the *Notice* recognizes (¶ 69 n.112), the reproduction cost standard has been long “discredited,” and with good reason. The use of “reproduction cost . . . destroy[s] the value of a replacement cost approach. It would, for example, allow inclusion of an expensive plant in the rate base despite technological change that destroyed the value of the existing plant. The more obsolete the plant, the higher might be the rates.” Stephen Breyer, *REGULATION AND ITS REFORM* 39 (1982); *Missouri ex rel. S.W. Bell Tel. Co. v. Public Serv. Comm’n*, 262 U.S. 276, 312 (1923) (Brandeis, J. dissenting) (“If the aim were to ascertain the value (in its ordinary sense) of the utility property, the enquiry would be, not what it would cost to reproduce identical property, but what it would cost to establish a plant which could render the service, or in other words, at what cost could an equally efficient substitute be then produced.”). Thus, the reproduction cost standard ignores all innovations and advances in efficiency that have occurred since the assets were installed.

18. As such, the reproduction cost standard does not replicate the rates that would prevail in effectively competitive or contestable markets. *Cf.* NERA (BellSouth) Decl. ¶ 73 (UNE rates should “replicate the results of a competitive market”); Weisman (Qwest) Decl. ¶ 40 (UNE rates should “emulate” “competitive markets”). A firm facing such market discipline cannot price at its reproduction costs where there have been any advances in technology.

Indeed, the defects in the reproduction cost standard have been so well known for so long that the very incumbent economists that support this standard now had long ago derided it as economically improper. “The ‘reproduction cost’ to which prices in purely competitive markets tend to correspond is not the current cost of reproducing the existing plant, brick by brick, but the current cost of producing the *service* with the most modern technology available.” Alfred Kahn, I THE ECONOMICS OF REGULATION, 112 (1970). If “particular assets are really to be replaced in kind, there must be something wrong with allowing *any* obsolescence in the annual depreciation charge.” *Id.* at 113 n.71 (emphasis in original). This is especially true for telecommunications firms whose capital is long-lived and can remain used and useful for decades.

19. Needless to say, the incumbents do not explicitly admit that they are advocating a reproduction cost standard here. Instead, they cloak their proposals in euphemisms such as “actual, forward-looking costs” (Weisman (Qwest) Decl. ¶ 49); “the true forward-looking costs that the ILEC is actually likely to incur” (Aron-Rogerson (SBC) Decl. at 43); and “the long run costs that the incumbent actually expects to incur going forward,” (Shelanski (Verizon) Decl. ¶ 2). Such euphemisms cannot hide the economic reality.

20. Verizon’s economic testimony reveals most vividly the true nature of the incumbents’ proposals. “The ILEC’s actual forward-looking costs can best be measured by basing UNE prices on the ILEC’s existing network, including the configuration of that network, its operational characteristics, and mix of technologies the ILEC will use to supply UNEs.” Shelanski (Verizon) Decl. ¶ 16. The “existing network” is then “revalu[ed]” by determining the “actual costs that would be incurred to put in place the ILEC’s existing network today.” *Id.* ¶ 21; *see also* Kahn-Tardiff (Verizon) Decl. ¶ 33 (rates should be based on “the replacement cost of

the current network, accounting for the amounts of equipment and the mix of vintages that it contains”).

21. In a perfunctory bow to forward-looking cost principles, Verizon suggests that some (but not all) of the network changes that it claims it will undertake in the next few years might be reflected in the “revalued” network. Shelanski (Verizon) Decl. ¶ 22. But these modifications concede the central flaw in the reproduction standard while doing nothing meaningful to cure it. By allowing rates to reflect near-term changes to the existing network, Verizon implicitly recognizes that the existing network design is *not* optimal and can be improved. But at the same time, the improvements that would be permitted – only those actually planned by the incumbent in the next few years – are clearly insufficient to achieve the level of efficiency that can be obtained over the long run, when all sunk costs are variable. *Local Competition Order* ¶ 677; *accord*, Weisman (Qwest) Decl. ¶ 22

22. The other incumbents, while paying lip service to forward-looking pricing principles, would also tether network element rates to the costs of reproducing the incumbents’ existing networks. BellSouth proposes to base rates on the “cost of a replacement network that assumes existing network routes and plant and equipment locations.” NERA (BellSouth) Decl. ¶ 50. If the existing network is populated with obsolete technology, the Commission must assume that this is a “judicious” and efficient result. *Id.* ¶¶ 51-52 & n.42.

23. Like Verizon, BellSouth proposes an alternative standard that implicitly concedes the illegitimacy of reproduction cost without offering any meaningful improvement. BellSouth’s alternative is a “blended” approach that would allow incumbents to recover *both* the costs of all upgrades planned by the incumbent over an “objective time horizon (e.g., three to five years)” – *i.e.*, the technologies “that will actually be deployed as new facilities and equipment are needed

to meet growth or as existing facilities/equipment are replaced” (BellSouth 19) – *and* the costs of the equipment “not being upgraded,” including assets whose costs are sunk (*id.* at 15-16). Again, the sunk assets would be valued at reproduction cost. BellSouth’s approach takes as given the incumbent’s “current network systems, routes, equipment locations, etc.” (*id.* at 16), “expected incumbent costs” (*id.* at 17), “real-world network attributes and cost inputs” (*id.* at 18). The result of these calculations, apparently, are to be presumed to be efficient even if the costs are inflated by “past inefficiencies” that result from “choices made in the past” (*id.* at 30-31).

24. Qwest too proposes what is essentially a pure reproduction cost standard. According to Qwest, UNE rates should be based on “the actual network characteristics of the incumbent provider”) – *i.e.*, the “network designs, technologies and practices that are currently used by telecommunications carriers . . . measured with reference to the real-world attributes and practices of telecommunications networks today.” Qwest at 15-18; *see also* Weisman (Qwest) Decl. ¶¶ 20, 22. Qwest does, however, suggest that the results of this approach would be merely presumed reasonable and states that this presumption could be rebutted only by showing that a more efficient technology or design has been “deployed on a scope and scale comparable to that of the ILEC.” Qwest at 15-21, 36-37; *see also* Weisman (Qwest) ¶¶ 37-43. The opportunity to rebut the (unfounded) presumption of efficiency is illusory. The only local carriers operating on a “scope and scale comparable to that of” one Bell company are the other incumbent Bells.

25. SBC, for its part, does not even concede that the “presumption” that reproduction costs are “efficient” can be rebutted. SBC demands that the Commission “abandon the premise that each aspect of [the] carrier’s network will reflect the cutting-edge efficiency of a perfectly competitive market or anything resembling it. SBC at 25. Instead, “efficiency” would be

redefined downward to mean only “the more realistic efficiency of the ubiquitous networks built up over time and operating by the ILECs whose ‘costs’ are at issue.” *Id.* An incumbent’s “actual network” is “the only reasonable means for measuring actual forward-looking costs . . . .” *Id.* at 26; *see also* Aron-Rogerson (SBC) Decl. at 43 (rates should be based on “the ILEC’s actual network and the actual level of efficiencies . . . that it has achieved”).

26. The identity of the incumbents’ proposed cost standards with reproduction cost is perhaps revealed most starkly by the inputs that the Bells advocate. They ask, for example, that the “route configuration and average loop length” found in the incumbents’ “existing network” should be taken as given, without considering whether “carriers building facilities today could deploy a network with a more efficient configuration” (Shelanski (Verizon) Decl. ¶ 50); that the “existing” mix of “loop technologies” should be deployed even if “an entrant could provide service more efficiently” using a different configuration (Shelanski (Verizon) Decl. ¶ 48); that the “structure mix” found in the incumbents’ “existing network” should also be taken as given without considering whether “carriers building facilities today could deploy a network with a more efficient configuration” (Shelanski (Verizon) Decl. ¶ 50); that “actual fill inputs in ILEC cost studies” should be deemed “dispositive” regardless of whether they represented efficient levels of spare capacity (NERA (BellSouth) Decl. ¶ 78); that the expenses recovered from UNE prices should equal the incumbent carriers’ current level of expenses (Qwest at 53); and that nonrecurring charges should be set on the presumption that current practices are efficient (NERA (BellSouth) Decl. ¶ 100-02). Indeed, to the best of my knowledge, the incumbents did not advocate the use of any network-related input value other than one based on existing network design and operational practices.

27. In seeking to defend these reproduction cost proposals, the incumbent economists illustrate the gulf between the reproduction cost standard and well-accepted economic principles. Drs. Kahn and Tardiff state that “[c]onsiderations of economic efficiency and efficient competition *require* that the prices charged to competitors be based upon the LECs’ *actual* costs . . . . In unregulated markets, prices tend to be set on the basis of the actual costs of incumbent firms, and they should be.” Kahn-Tardiff Decl. ¶¶ 26, 29 (emphasis in original). These actual costs, Kahn and Tardiff add, necessarily reflect the “cumulative impact of business decisions over time that determines the configuration and vintages of the firm’s capital assets.” *Id.* ¶ 31. “Because of the durability of many components of networks in the telecommunications industry, new business decisions in the industry will typically be constrained by the accumulation of previous decisions.” *Id.*

28. Kahn and Tardiff propose two alternative ways to estimate the “actual” costs of a firm that operates with long-lived assets of varying vintages. Their first proposal would “measure the total quantities of network components required by the incumbent’s existing network (taking into account how it is actually expected to evolve over a reasonable planning period) and estimate the respective values of those components . . . taking into account the mix of vintages that the network includes.” *Id.* ¶ 35 & n. 25. UNE prices would equal “a proper return on the value of the underlying capital” plus depreciation charges and out-of-pocket expenses. *Id.* The second proposal offered by Drs. Kahn and Tardiff (*id.* ¶ 36) is a version of incremental cost:

It identifies expected volumes of demand anticipated over a certain business planning period and the investments and operating costs anticipated to satisfy that demand. Because such measurements would be based on actual business plans, the quantities and particular types of the necessary components, their prices and associated operating costs would be dictated by the characteristics of the network that actually provides them. As such, such a calculation identifies the economic

resources (capital and operating) that will be expended in producing the volume of network elements in question.

29. The most striking aspects of these proposals is not what Drs. Kahn and Tardiff say – few economists would disagree with the quoted statements – but what the authors ignore: how to measure the “value” of the long-lived sunk investment that is already in place at the beginning of the study period. This, however, is the central issue. When the incumbent firm’s existing sunk investment is valued properly, then the two proposals offered by Kahn and Tardiff become effectively equivalent to the TELRIC standard that they deride elsewhere in their declaration – and utterly inconsistent with the reproduction cost proposals that Kahn, Tardiff, Verizon, and the other incumbents ask the Commission to adopt.

30. These conclusions follow from the definition of long run and short run costs. All relevant cost measures, whether long run or short run, are measures of the flow of costs over a specific period (annual, weekly or whatever) – not the sum total of costs over time periods that are different from each other. The real difference between these concepts involves the length of time before the enterprise’s inherited sunk assets lose their remaining value.

31. Long run costs – of which TELRIC is an example – are forward looking from today, cost minimizing, and unconstrained by the firm’s past investment decisions. Long run costs are of course influenced by exogenous factors such as input prices, technology, the physical environment, and the characteristics of demand, but are unaffected by the existence or value of inherited capital assets, or by contractual constraints held over from the past.

32. Short run (and medium run) costs are still cost-minimizing looking forward from today, but – unlike long run costs – reflect a planning period in which investments in long-lived

assets inherited from the past remain sunk.<sup>1</sup> The sunk investment in these assets cannot be converted into cash and made fungible. The assets, however, still can provide some productive functionality, and their existence influences forward-looking decisions on what inputs to deploy afresh. As Kahn and Tardiff indicate, short run costs certainly include all forward-looking new expenditures needed during the planning period. The question unanswered by Kahn and Tardiff, however, is how to value the inherited sunk assets themselves. Economists have identified three alternative approaches to this question:

33. The first approach would assign no costs at all to the inherited sunk investment. Since the investment is sunk, there is no opportunity cost of using it. (That is, if you decide not to use the assets, no costs of their financing are thereby saved or avoided; likewise, if you decide to use them, there are no additional such costs that result.) Short run costs (“SRC”), so defined, are necessarily equal to or less than long run costs (“LRC”). Qwest (Wiseman) Decl. ¶ 22. This follows because in the short run scenario, one way to produce the same outputs would be to ignore the sunk assets and buy all inputs fresh, in which case short run costs would equal long run costs. Hence, if the owner of the sunk assets elects to continue using them (as incumbent carriers typically do), doing so must be as cheap as, or cheaper than, starting fresh. Ergo, with this treatment,  $SRC \leq LRC$ .

34. The second approach would assign costs to the inherited sunk assets according to their appraised value. The appraised value of the assets is the present discounted value of the savings their use would permit an enterprise in the business, as compared to not using the assets and starting fresh. If the sunk assets were not used at all, the enterprise would incur long run

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<sup>1</sup> The difference between short run costs and medium costs is just a matter of degree. Medium run costs are the same concept as short run, except that the sunk assets have more time remaining (continued . . .)

costs. Since the appraised value makes the enterprise indifferent between using the sunk assets or not, this standard leaves the enterprise with  $SRC = LRC$ .

35. The third approach would equate the costs of the inherited sunk assets with their reproduction costs. From this perspective,  $SRC > LRC$ , except in the fortuitous case that an enterprise unconstrained by any legacy assets from the past would efficiently choose exactly the same assets that had been chosen historically, even if the prices of outputs produced by those assets were also unchanged. (In this unlikely circumstance,  $SRC = LRC$ .) This approach, however, violates economic logic. If intervening advances in technology progress and other changes in economic circumstances have rendered an enterprise's old assets an inefficient choice (at least at their old prices), then the efficient enterprise would not elect to reproduce the old assets. Hence, the appraised value of those assets is less than their reproduction cost, and a measure of short run cost that includes their reproduction cost is biased upward.

36. Professor Kahn, in his previous professional work, has recognized that the correct approaches to valuing sunk investment are the first two of these alternatives, not the third. He has emphasized that sunk assets, if valued at all, must be revalued downward to reflect their reduced market value – and the resulting reduction in their forward-looking opportunity cost that alone renders efficient their continued use. “If the economic value were correctly stated on the books the addition of gross return on that net book value to the variable costs of operating the old plant would produce a cost of service exactly equal to that of a new plant.” I Alfred Kahn, *ECONOMICS OF REGULATION* 121 (1970). In either event, the reproduction costs of the sunk assets – alternative three above – are irrelevant (*id.* at 118):

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(. . . continued)  
before they become valueless.

In either event, the continuing, fixed costs on the old equipment—the depreciation that may not yet have been fully recovered, the return on the net investment not yet fully written off, interest on the debt already incurred—are irrelevant to the decision. Sunk costs such as these are bygones, unchangeable past history, and best forgotten.<sup>2</sup>

37. In sum, the incumbent carriers' reproduction cost proposals are completely at odds with these principles. The incumbents are trying to have it both ways: recovering the higher operating costs of obsolete embedded assets, without making the offsetting downward revaluation in the *investment value* of those assets that a competitive market would require.

38. The other incumbent economists likewise attempt no meaningful theoretical defense of the reproduction cost standard. In fact, as noted, they concede, that network element rates should “emulate competitive market outcomes” (Weisman (Qwest) Decl. ¶ 40) and, therefore, “CLECs should not have to pay UNE prices that compensate ILECs for past inefficiencies” (NERA (BellSouth) Decl. ¶ 65); *see also* NERA (BellSouth) Decl. ¶ 73; Shelanski (Verizon) Decl. ¶ 7. Instead, the incumbent economists attempt to defend the use of reproduction costs on a different ground. They contend that the “reproduced” network is close enough to the “replaced” network for the task of setting UNE rates. In particular, the incumbent economists contend that the existing incumbent networks should be “presumed” to be “efficient” because of existing “price cap” regulation and “intermodal competition.” Aron-Rogerson (SBC) Decl. at 39-43; Kahn-Tardiff (Verizon) Decl. ¶ 10; NERA (BellSouth) Decl. ¶ 66; Shelanski (Verizon) Decl. ¶ 16; Weisman (Qwest) Decl. at 18-22. Alternatively, the incumbent economists

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<sup>2</sup> In his treatise, as in his testimony, Dr. Kahn qualifies these statements with the condition that, for regulated firms, the depreciation charges allowed by the regulator be large enough to cover the diminution in the economic value of the sunk investment. *Id.* at 118-19. As explained elsewhere by me and by AT&T witness Richard Lee, however, the depreciation standards adopted by the Commission are consistent with this condition.

contend that the theoretical deficiencies in the approach that they advocate can be overlooked on the grounds that “reproduction costs” is an easily applied standard. Kahn-Tardiff (Verizon) Decl. ¶ 32; Shelanski (Verizon) Decl. ¶ 2. None of the asserted justifications withstand scrutiny.

39. *Price Caps.* I have already explained in detail in my prior declaration (¶¶ 51-58) why “price caps” are not sufficient basis to presume that existing incumbent network design and operation is efficient. So have two other AT&T witnesses, John Klick and Lee Selwyn. The incumbent economists largely ignore these issues, and simply repeat anew the notion that price caps, by weakening the direct link between an incumbent’s costs and rates, create incentives for *some* improvement in efficiency. *See, e.g.,* Aron-Rogerson (SBC) Decl. at 41-43; Kahn-Tardiff (Verizon) Decl. ¶ 10. This proposition does not begin to justify the use of reproduction or embedded costs as a surrogate for long run incremental costs.

40. Price cap regulation, even in its purest form, is not equivalent to effective competition, and cannot be expected to “incent” the incumbents to deploy and maintain fully efficient networks. Firms in competitive markets that fail to achieve the most efficient cost structure also face the real prospect of not just a decrease in profits, but the loss of substantial market share and, potentially, being driven from the market altogether. Price cap regulation does not mimic this incentive.

41. Price caps also do not fully break the link between the costs that the incumbent incurs and the rates it may charge. *Verizon*, 535 U.S. at 486 (price caps “do not eliminate gamesmanship”). In practice, price caps are only a modified form of rate-of-return regulation. The price cap rate ceiling is always subject to change by the regulator – and the typical basis for altering the index is that a company’s costs have increased at a greater rate than the index. Kenneth Train, *OPTIMAL REGULATION* 327 (1991) (under price cap regulation, a firm will have

incentive to “waste so as to convince the regulator to allow a higher cap”). By overinvesting in network capacity, the incumbent provides itself with a powerful argument to seek adjustments to the index that would allow the incumbent to increase its rates. *Id.*

42. Perhaps the most important reason that price cap regulation cannot be presumed to have “incented” the incumbents to deploy optimally efficient networks is the sunk nature of much of facilities used to provide telecommunications services. NERA (BellSouth) Decl. ¶ 87. Incumbents have no incentive to eliminate the excess network capacity that was deployed under prior rate-of-return regulation because the going-forward costs of carrying excess capacity are negligible compared to the costs of removing it. And where demand has been relatively flat or declining, that excess capacity will persist indefinitely.

43. More broadly, price caps do not alter the fact that current investment decisions by incumbents are constrained by the sunk nature of the assets and do not necessarily reflect the most efficient practice. From the time of implementation of even a “perfect” price cap system, the regulated firm would be motivated to minimize costs in the sense of going-forward cash costs, given the then-current endowment of sunk assets. These forward-looking costs are substantially less than TELRIC because they omit any costs associated with sunk assets.

44. Thus, once an incumbent has deployed a long-lived, sunk asset, that past investment will cause the incumbent to make investment decisions going forward that, while perhaps efficient on the basis of short run considerations which value these investments practically at zero because they are sunk, do not result in a network that is today optimized to serve current demand. For example, if an incumbent made sunk investment in technology that remains capable of providing service today but that is no longer the most cost-effective technology, the inefficient technology may persist in the incumbent’s network because it is

cheaper to remain that technology in place than to replace it. Similarly, outside plant that is no longer necessary because of changes in where service is demanded will remain in place until it is more costly to maintain it than to remove it.

45. Dr. Shelanski makes this exact point in his declaration:

The mix of facilities and technologies that the ILEC will purchase going forward will necessarily be informed by its existing network configuration and technology. . . . Thus, for example, even if a carrier starting from scratch might deploy a substantial amount of technology known as GR-303 as its switching interface, it may well be inefficient for an ILEC to do so because, among other things, using GR-303 might require it to incur additional costs such as changing other incompatible technologies in its network or developing new operations support systems.

Shelanski (Verizon) Decl. ¶ 30. So too do Drs. Aron and Rogerson. *See* Aron-Rogerson (SBC) Decl. at 19 (“since the ILEC is not able to replace its entire plant at once, but instead does so incrementally over time, the ILEC . . . is necessarily constrained in its ability to adopt new technology than is a hypothetical new entrant.”).

46. Moreover, even if the incumbents were correct that price caps gave them powerful incentives to operate their existing network efficiently, that is not the “network” relevant for the regulatory purposes at issue. To the extent that incumbents are maintaining an optimally efficient network, it is their “actual” network that is used to provide a broad array of services (*e.g.*, local telephone, broadband, wireless). In the wake of the *Triennial Review Order*, however, competitive carriers are entitled to obtain unbundled access to only a fraction of the capabilities of that network. It simply cannot be “presumed” that investment made to maximize the efficiency of the multi-product network is the most efficient network to provide the UNEs at issue here. For example, it may make perfect sense for incumbents to push fiber further into their network to provide broadband services, but such investment may not be necessary efficiently to provide narrowband UNEs that are being made available to competitive carriers.

Likewise, it may be efficient for incumbents to deploy capacity today to serve future demand, but the costs of those “existing” facilities must be charged to the future ratepayers that use the capacity, not in the lease rates paid by current UNE purchasers.

47. Finally, the incumbents ignore altogether the impact that expressly linking UNE rates to existing network design would have on incumbent incentives. The reproduction cost standard advocated by the incumbents would largely, if not entirely, negate the hypothesized benefits of price cap regulation. Under the reproduction standard, the incumbents would be able to recover their costs, whether or not they were incurred inefficiently, through the access rates they charge their competitors.

48. Indeed, taken to its logical extreme, the incumbents would put in place a regime that contains the worst aspects of traditional rate-of-return regulation. To the extent that price caps were in fact biting into incumbent retail margins, the incumbents could cede that retail business to competitive carriers and supply them at wholesale the necessary network access. And under the incumbents’ reproduction cost standard, they would be entitled to a competitive return on capital for all of their assets (regardless of whether “used and useful” or “prudent”).

49. In contrast, TELRIC-base rates provide no such anticompetitive incentive. TELRIC prices are not influenced by the actual investment or operational decisions of the firm, but are set on the basis of efficient costs. Indeed, in this respect, TELRIC is superior to price caps because it allows prices to evolve in a relatively exogenous way in order to eliminate windfalls.

50. *Intermodal Competition.* The proposition that the incumbents are already subject to effective facilities-based competition (and therefore, can be presumed to have adopted efficient network design and practices) cannot be credited. *See* Kahn-Tardiff (Verizon) ¶ 10;

Shelanski (Verizon) ¶ 16. The Commission in the *Triennial Review Order* expressly considered whether there were alternative providers of the network elements at issue and concluded that there generally were *not*. Cable telephony serves only a small fraction of the country, and its long-term prospects for expansion are now in grave doubt. *Triennial Review Order* ¶¶ 52, 222, 229. And while wireless services are more ubiquitous, consumers do not now view them as fully adequate substitutes for local, wireline services. *Id.* ¶ 230. VoIP has gained only a handful of customers to date, and is only available to the fraction of consumers that have (and pay extra for) broadband Internet access.<sup>3</sup>

51. These facts also provide a complete response to the claim that TELRIC is impeding voluntary “wholesale” arrangements. The Commission has unbundled only those elements for which it has found that multiple competitive supply is not possible. Kahn-Tardiff (Verizon) Decl. ¶ 13. In those circumstances, incumbent carriers have absolutely no incentive to provide access to their local networks at rates, terms and conditions that would threaten their current ability to earn supracompetitive rates. *Local Competition Order* ¶ 141.

52. *Ease of Implementation.* Lastly, the incumbent economists try to shore up the manifest problems with their proposed reproduction cost standard by contending that it has the virtue of “accurately” calculating costs. Kahn-Tardiff (Verizon) Decl. ¶ 32; Shelanski (Verizon) Decl. ¶ 2. Even if true – and as I will explain below, it is not – there is no benefit to the Commission in accurately calculating the reproduction costs of an existing network. All this

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<sup>3</sup> VoIP is a *protocol* for transmitting information over facilities, and VoIP providers use the incumbents’ local loops and transport facilities to originate and terminate calls. Vonage, the nation’s largest provider of VoIP services, claims about 50,000 total lines – about one-fortieth of one percent of the mass-market total. *See, e.g.,* [www.vonage.com/corporate/press\\_index.php?PR=2003\\_09\\_23\\_0](http://www.vonage.com/corporate/press_index.php?PR=2003_09_23_0).

would accomplish is accurately determining the level of inefficiency that persists in the existing network design and operation. *Accord*, I Alfred Kahn, *THE ECONOMICS OF REGULATION* 199 n.39 (“An approximation, even one subject to wide margin of error, to the correct answer is better than the wrong answer worked out to seven decimal places.”)

53. Further, for the reasons I explained above, the reproduction cost standard advocated by the incumbents does not avoid the use of “hypothetical” network assumptions. A large share of the investment in existing local networks is not “attributable to” or “caused by” the UNEs at issue here. For example, where loop investment was made for purposes of broadband services (*e.g.*, fiber-to-the-curb), competitive carriers clearly should not have to pay for the higher cost of these facilities when the narrowband services that they are permitted to provide use lower cost facilities. Under the incumbents’ test, in each such instance, a “hypothetical” network would have to be substituted for the “existing” network in order to calculate UNE prices (or potentially an arbitrary allocation made between broadband and narrowband costs).

54. In any event, the Commission should be highly skeptical about any claim that “reproduction cost” is easily implemented. As Mr. Klick described at length, the incumbents simply do not maintain the data in the form that is required to accurately calculate the costs of reproducing the existing network. First, recent audits have concluded that the incumbents’ investment records for hard-wired central office equipment are bloated with “phantom” assets. *Continuing Property Records Audit*, 14 FCC Rcd. 7019, ¶ 1 (1999) (“upon a physical examination of the companies’ central offices, neither company personnel nor Bureau auditors were able to locate certain central office equipment which is recorded in the companies’ books and accounts”). Further, the incumbent carriers’ outside plant records reflect outdated cable routes and/or cable descriptions, and include redundant or duplicate plant. Klick Decl. ¶¶ 58-74.

Finally, incumbents simply do not maintain records that can accurately describe, in any sort of readily retrievable and usable fashion, the actual quantities and locations of cables, poles, conduits, trenches and cable types that are currently in place in the ground today in any given study area. *Id.* ¶¶ 68-74. Rather, “these records are maintained only for broad categories of plant” and cannot be used to determine accurate per-line costs. Bryant Essay at 4.

55. The reproduction standard would also put competitive carriers (and state commissions) at an enormous disadvantage vis-à-vis the incumbents in developing and verifying cost models based on reproduction costs. By definition, the point of the reproduction cost is to determine the cost of existing incumbent facilities. The only entities that could possess that information, of course, are the incumbents (and as noted, even they do not possess all of the required information).<sup>4</sup> And, contrary to the incumbents’ claims, the incumbents would have strong incentives to manipulate the data to their advantage. Weisman (Qwest) Decl. ¶ 46 (“This incentive to overstate costs is not necessarily present in an environment in which rivals have the option to self-provision their own networks, purchase network capacity from a third-party, or lease network elements from the incumbent providers.”). For the network elements at issue, competitive carriers do *not* have the option of self-provisioning or leasing from third-parties. And it is precisely because the only option is leasing access from the incumbent provider, that the incumbent has a strong incentive to manipulate the data that it controls to raise the cost of the access.

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<sup>4</sup> At the same time it claims that costs should be based exclusively on information that would solely be in its position, Verizon also asks the Commission to diminish greatly the ability of competitive carriers and state commissions to discover that information. Verizon at 106.

56. These problems would be amplified to the extent that costs would be based on the existing network as modified by those short-term improvements contemplated by the incumbents. Rather than being “objective and verifiable” (Shelanski (Verizon) Decl. ¶ 18), the incumbents’ network modifications plans are, by definition, subjective, unverifiable, and known only to the incumbents themselves. Thus, at bottom, state commissions would have little option but to allow incumbents to “self-report” planned network upgrades. And to the extent that these changes are designed to increase efficiency and lower cost of service, the incumbents would have strong incentive to avoid disclosing them.

57. Finally, the incumbents’ advocacy on this point is called into question by their failure to support their claims with evidence. In the *Local Competition* proceedings, the parties advocating a forward-looking economic cost standard sponsored detailed cost studies and provided those studies to the Commission. Thus, the Commission had before it proof that verifiable cost studies could be developed to implement the LRIC standard, including four working cost models based on the TELRIC standard or some variant of it. *Local Competition Order* ¶¶ 794-96. Here, by contrast, despite saying how easy it is to implement the reproduction cost standard, the incumbents have offered no cost study or cost model based on that standard for the Commission to study. The cost models needed to implement a reproduction cost standard are, at this point, vaporware, and the underlying data are seemingly nonexistent.

### **III. THE INCUMBENT ECONOMISTS’ CRITIQUE OF LRIC-BASED UNE RATES IS UNFOUNDED.**

58. Given the manifest weaknesses in the reproduction cost approach, the incumbent economists understandably devote their energy to attacking TELRIC. But these criticisms are as unfounded as the reproduction cost standard that the incumbents offer as an alternative. At core, the Bells’ basic complaint is that TELRIC requires that UNE rates be set on the basis of the

lowest achievable costs of providing the UNEs, rather than the incumbents' (presumably higher) "actual" costs. Rather than a reason to condemn TELRIC, this confirms its appropriateness.

59. *TELRIC Is Fully Compensatory.* The incumbents' major criticism of TELRIC is that it assumes a level of efficiency greater than an incumbent may be able to achieve in practice. In particular, they state that TELRIC continuously requires that costs be based on efficient technology and network design, but that the network investments made by incumbents often will be rendered obsolete by technological advances. Because this investment is sunk, the incumbents argue, they are limited in their ability to optimize their network. *See, e.g., Kahn-Tardiff (Verizon) Decl.* ¶¶ 17-20; *NERA (BellSouth) Decl.* ¶ 19; *Shelanski (Verizon) Decl.* ¶¶ 7-10. Thus, they claim that incumbent carriers will never be able to achieve the level of efficiency that a new entrant could and TELRIC systematically prevents them from recovering efficiently incurred costs.

60. The incumbents' complaint is not with TELRIC, but the dynamics of fully competitive or contestable markets. In competitive/contestable markets, a company can charge prices for services that cover only the costs of providing those services in the most efficient manner, even if the company actually paid more for the equipment it uses to provide that service. Competitive forces cannot make any allowance for historical costs because no current rival will abstain from competing via a final-product price that covers only the forward-looking costs of its investment, whether or not they exceed the historical costs. And since competitive market prices are those that are required for economic efficiency, the Commission should require UNE prices be independent of embedded cost and to be based instead on the costs of efficient operation.

61. The incumbents are likewise wrong in suggesting that "efficiency" is judged by whether an investment decision was efficient when made by the incumbent in the past, given the

constraints it faced at the time. BellSouth (NERA) Decl. ¶ 65. First, as explained above, because of the existence of already sunk assets, incumbent carriers will make investment decisions that are perfectly reasonable in the short run but that do not reflect the choices that would be made in the long run and that would result in optimal efficiency. Second, competitive markets do not care if a decision in the past was appropriate at that time. It may make perfect sense for a firm to deploy a certain type of technology, but if subsequent advances render that technology obsolete, a firm facing effective competition will not be able to set prices based on the full original costs of that investment.

62. Notably, incumbent economists concede that in fully competitive/contestable markets prices are driven down toward long run costs and that, in the long run, “all inputs are variable.” Shelanski (Verizon) Decl. ¶ 35; NERA (BellSouth) Decl. ¶ 55 (“The real point of the long run is that it represents the length of time over which a firm can adjust production to move as close as possible to its most efficient level.”); Weisman (Qwest) Decl. ¶ 22 (“A short run average cost methodology is inappropriate on multiple grounds.”).

63. It is no answer to observe, as Verizon witness Dr. Shelanski does, that “in the real world in most cases” a firm will vary only a few of its inputs because “technology” is changing over time and it is difficult to estimate such changes. Shelanski (Verizon) Decl. ¶ 35. In competitive and contestable markets, the commercial availability of more productive technologies and practices sets a cap on the rates that incumbents can charge – whether or not they adopt the innovations themselves. Thus it is irrelevant that an incumbent firm may in the short term plan to make only a small number of changes that could be made over the long run to increase efficiency. *Id.* ¶ 36. In fully competitive or contestable markets, the value of those assets is capped at the costs of the most efficient provider, regardless of what changes the

individual firm may take. *Accord*, NERA (BellSouth) Decl. ¶ 74 (“If competitors can deploy new services or the same services at lower costs, particularly if the incumbent fails to do so, then there will be greater pressure [for the incumbent] to accelerate deployment of new technologies into the network.”).

64. To the extent Dr. Shelanski is arguing that calculating “long run” costs somehow requires “speculat[ion]” about future technology and conditions (Shelanski (Verizon) Decl. ¶ 35), he simply misunderstand TELRIC. The TELRIC standard assumes only technology that is commercially available, and which can be demonstrated to provide current services at the quality level demanded by consumers. Likewise, in determining the size and configuration of the network, TELRIC does not require speculation about future demand, but simply asks how existing demand can be served most efficiently.

65. Nor is there any truth to the claim that such competitive-market pricing must generally be noncompensatory because, if production technology or input prices improve in the future, costs will go unrecovered. Aron-Rogerson (SBC) Decl. at 20; Kahn-Tardiff (Verizon) Decl. ¶¶ 17-20; NERA (BellSouth) Decl. ¶ 19; Shelanski (Verizon) Decl. ¶ 36. Forward-looking investment decisions are based on the firm’s best expectations of future trends in prices, demand, technological innovation, and equipment values. Thus, if a competitive market expects these prices and values to decline, the firm will reflect this expectation in its offer prices for current equipment and its depreciation charges against such equipment. The Commission’s TELRIC rules likewise require that depreciation and capital costs reflect these considerations. Hence, both competitive markets and TELRIC pricing provide for full *ex ante expected* compensation of investments.

66. Of course it is always possible that previous expectations will turn out to be incorrect and for a firm to find, *ex post*, that it has incurred uncompensated costs. But this is a risk that any firm in a competitive market must face, and a risk that the 1996 Act requires incumbents to face. Investment decisions must be made before all uncertainties can be resolved, and indeed in the real world they can never disappear. Neither competitive markets nor TELRIC can immunize an incumbent against unforeseen losses.

67. Notably, there is nothing unique about the “dilemma” asserted by the incumbents. The risk that sunk investment will be reduced in value (or even rendered worthless) by subsequent advances in technology, whether foreseen or not, is present in many industries. Yet such investments are routinely made because the *ex ante* compensation of investment promised to investors (return on capital and depreciation) is sufficient to compensate for this risk that later actual or potential entry will devalue the sunk assets.

68. Again, in competitive and/or contestable markets, irreversible decisions to commit to sunk assets are often unavoidable. These decisions entail a variety of types of risks, including the risk that tomorrow it may become clear that the firm would chose a type or configuration of assets that is not what it would choose today or would have chosen with the benefit of hindsight. The risk involved, however, is part of the cost of capital, however (arbitrarily) divided between return on, and return of, capital components of the cost of capital. So, for example, if a pole physically lasts forever so that there is no depreciation, but it might be made obsolete because it was placed in the wrong location, the risk of that could be put into the overall rate-of-return (and presumably investors have already done that to some extent in their extant requirements). In other words, the total percentage return of, plus return on, investment is

what matters to investors, not the division between the two. Sometimes that division is useful as a guidepost, but it never is controlling as far as investors are concerned.

69. Despite their anti-TELRIC rhetoric, the incumbent economists have acknowledged these very points. In a filing made in the *Triennial Review* proceeding, Dr. Kahn and Dr. Tardiff testified that “in its reply brief to the Supreme Court, the FCC described how, in principle, TELRIC can be sufficiently flexible to accommodate investment risks in a way that is approximately correct economically.” Reply Declaration of Alfred Kahn and Timothy Tardiff, CC Docket Nos. 01-338 *et al.*, ¶ 40 n.52 (July 17, 2002) (citing Reply Brief for Petitioner FCC in *Verizon Communications Inc. v. FCC*) (hereinafter “Gov’t *Verizon* Reply Br.”). These incumbent economists also made the same concession in the original *Local Competition* proceeding. Gov’t *Verizon* Reply Br. at 10-11 (“Indeed, in the FCC rulemaking that produced TELRIC, the incumbents acknowledged that an accurate calculation of economic depreciation and the costs of capital would obviate the problem that they allege here.”) (citing statements).

70. The government’s description of TELRIC before the Supreme Court emphasized the same points I am making here. The government observed that it had prescribed no particular depreciation lives or cost of capital and that state commissions remained free to “to accommodate[] reasonable economic assumptions about future technological advances and the effects of those advances will have on the value of current assets.” Gov’t *Verizon* Reply Br. at 11. Likewise, TELRIC requires a “risk-adjusted cost of capital” that takes into account “existing competitive risks” but “also risks associated with the regulatory regime to which a firm is subject.” *Id.* at 12 & n.8. Thus, “[i]f depreciation lives and risk adjustment rates are calculated reasonably accurately, firms will be able to recover the costs of efficient investments [and] [t]hus the TELRIC approach, theoretically, is able to cope with the problems that worry its opponents.”

Gregory Rosston and Roger Noll, *The Economics of the Supreme Court's Decision on Forward Looking Costs*, 1 Review of Network Economics 81, 84 (Sep. 2002).

71. Given this unassailable logic – and their prior statements – the incumbent economists begrudgingly concede the “theor[y]” underlying TELRIC is sound. Kahn-Tardiff (Verizon) Decl. ¶ 21; Shelanski (Verizon) Decl. ¶ 14; *see also* Kahn-Tardiff (Verizon) Decl. ¶ 19 (conceding that even where investment requires “heavy sunk costs” and there is “continuous technological change” that can be expected to devalue that investment, firms will invest the “most recent technology from the ground up” so long as they can charge rates that cover forward-looking “depreciation . . . and rates of return”). Nonetheless, they argue that “in practice” that regulators have not set the appropriate, forward-looking depreciation lives. Kahn-Tardiff (Verizon) Decl. ¶ 21. But that is a quite different (and much narrower) claim. If it were correct, the solution would not be to jettison TELRIC, but to require state commissions to use depreciation lives that best reflect how equipment values will change in the future because of anticipated technological change.

72. Moreover, the incumbent economists do not even attempt to establish this more modest criticism. If the incumbents were correct that Commission-prescribed lives are too long, one would expect to see shrinking depreciation reserves. The depreciation reserve is the ratio of accumulated depreciation divided by net plant investment and, as such, represents the share of a carrier’s original investment that has already been covered by depreciation charges. The available evidence is that the incumbents’ depreciation reserves have been growing, not declining. As documented by Mr. Lee in his initial declaration, since the Commission adopted forward-looking depreciation lives, industry depreciation reserves – including regional Bell company

depreciation reserves – have steadily increased, and are now at all-time highs. Lee Decl. ¶¶ 15-21 & Att. 4-5. Thus, there is no empirical support for the incumbents’ position on depreciation.

73. It should not be surprising that the existing lives adopted by regulators have not been proven inadequate. Contrary to the incumbent economists’ suggestions (Kahn-Tardiff (Verizon) Decl. ¶ 21), the regulatory depreciation lives prescribed by the Commission and that are generally used by the state commissions are expressly based on analyses of “company plans, technological developments, and other future-oriented studies.” *1999 Update*, 15 FCC Rcd. 242, ¶ 5 (1999). Hence, the “prescribed lives are not based solely on the engineered life of an asset, but also consider the impacts of technological change and obsolescence.” *Universal Service Order*, 14 FCC Rcd. 20156, ¶ 427 (1999). In short, the “depreciation expense calculations based on the Commission’s prescribed projection lives and salvage factors represent the *best forward-looking estimates* of depreciation lives and net salvage percentages.” *1999 Update* ¶ 61.

74. The incumbent economists also complain that even appropriate depreciation lives are insufficient because they apply to a asset “base” that is potentially lower than an incumbent’s “actual” investment, thus resulting in undercompensation. Kahn-Tardiff (Verizon) Decl. ¶ 22. Specifically, Drs. Kahn and Tardiff contend that existing TELRIC models reflect engineering assumptions that understate “the number of telephone poles, lengths of cables of particular sizes, central office switches, etc., needed.” *Id.* The witnesses offer no evidence to support these claims. If they are correct, however, the solution is for state commissions to use appropriate engineering assumptions, not to jettison TELRIC in favor of a reproduction cost standard.

75. I do agree with the incumbents on one limited point: it is at least theoretically possible that TELRIC may lead to underrecovery of inefficiently incurred costs that are

compelled by state law.<sup>5</sup> In particular, the incumbents claim that carrier-of-last-resort obligations require them to maintain lower fill factors than they otherwise would. NERA (BellSouth) Decl. ¶ 22.

76. As an initial matter, this line of argument is inconsistent with the incumbents' claims that their networks are in fact efficient. And it is also not a basis for increasing UNE rates above TELRIC levels. The incumbents have offered no proof that carrier-of-last-resort obligations have in fact led to cost under-recovery. Equally important, costs that are not recovered through the incumbents' retail rates should *not* be included in wholesale UNE rates. As the Commission properly recognized in the past, such a surcharge would potentially impede the development of local competition. *Local Competition Order* ¶ 705. Rather, these costs should be recovered through appropriate, competitively neutral universal service contributions. *Id.* ¶ 707; *see also* Gregory Rosston and Roger Noll, *The Economics of the Supreme Court's Decision on Forward Looking Costs*, I Review of Network Economics 81, 86 (Sep. 2002) ("Any pricing method that allows the mistakes of the past to be made up in UNE prices that are too high is inherently anticompetitive. . . . The FCC attempted to deal with [the problem of inefficient regulatory obligations] by requiring a competitively neutral fee to make up for any embedded costs that are not paid for through the combination of ILEC wholesale and retail sales.").

77. *TELRIC Is Not Internally Inconsistent.* Second, the incumbent economists claim that the Commission's TELRIC rules are internally inconsistent. Aron-Rogerson (SBC) Decl. at 18-21; Kahn-Tardif (Verizon) Decl. ¶¶ 16-17; Shelanski (Verizon) Decl. ¶ 14. Specifically, the incumbent economists claim that while TELRIC is intended to mimic the workings of a

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<sup>5</sup> However, depending upon the basis upon which the cost of capital is determined, such risks may very well be reflected and no additional compensation is required.

“competitive market,” in practice return on capital is set on the (correct) assumption that incumbents face very little facilities-based competition for the network elements at issue.<sup>6</sup> Thus, the incumbents argue, to be consistent, capital costs should be based on the assumption that multiple facilities-based competitors exist. Putting aside whether this difference would require a significant adjustment to the cost of capital, the incumbent economists have failed to demonstrate any inconsistency between the theory upon which TELRIC is based and how it is implemented in practice.

78. The basic flaw in the incumbent’s reasoning is that it equates the competitive market framework for application of LRIC pricing with the assumed existence of multiple facilities-based competitors. This is a *non sequitur*. Although it is, of course, correct that a market with numerous, vigorous firms will ordinarily be competitive, the existence of multiple competitors in a market is not a *necessary* condition for that outcome. Markets will also achieve competitive results when effectively *contestable*. The contestable market standard “offers a generalization of the notion of purely competitive markets, a *generalization* in which fewer assumptions need to be made to obtain the usual efficiency results. Using contestability theory, economists no longer need to assume that efficient outcomes occur only when there are large numbers of actively producing firms. What drives contestability is the possibility of costlessly reversible entry.” William Baumol, John Panzar and Robert Willig, *CONTESTABLE MARKETS AND THE THEORY OF INDUSTRY STRUCTURE* xiii (rev. ed. 1988) (emphasis added); *see also generally* Willig Decl. ¶ 23 (citing authorities). Of course, this does not mean that a market with a single incumbent supplier will necessarily exhibit competitive outcomes. In many cases, such

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<sup>6</sup> In this regard, I note that the incumbent economists are inconsistent with their claim that the incumbents currently face effective competition.

as the local telephone markets at issue here, it will not because the incumbent is protected by substantial barriers to entry. Thus, regulation, such as the pricing of access to the incumbents' facilities, is necessary to prevent the exercise of ILEC market power and to replicate the workings of a competitive market.

79. For these same reasons, the incumbents are incorrect in asserting that there is tension between TELRIC's assumption that service is provided by a "single carrier" that operates an efficient network that is capable of serving all customer locations within a particular geographic area and the competitive market benchmark for LRIC. In a fully contestable market, service may be efficiently provided by a single incumbent firm whose prices are impelled to converge to LRIC. This framework is particularly apt here, for the network elements at issue are characterized by steep economies of scale and scope (*Triennial Review Order* ¶¶ 87-90), and are most efficiently provided by a single firm. Lastly, TELRIC does not have to include the "full costs" of "obtaining the rights of way and authorizations needed to build the network today from scratch" in order to be "consistent." *E.g.*, SBC at 57. Of course, I agree with the point that the costs that an efficient provider of UNEs would incur in obtaining the necessary rights-of-way and authorizations should be included in UNE rates. The incumbents, however, appear to be contending that the costs of obtaining such authority today would be substantially greater than the incumbent itself incurred in obtaining them, as evidenced by the onerous terms that municipalities and landlords impose on competitive carriers that seek to obtain necessary rights-of-way from these entities.

80. Although the incumbents are correct that competitive carriers are subject to discrimination in access to rights-of-way, that does not mean that the terms imposed on these carriers are the appropriate ones to use in a TELRIC study. The discriminatory terms and

conditions imposed on competitive carriers for access to rights-of-way constitute a classic entry barrier in that they add up to a cost that second-mover competitive carriers incur but the incumbent avoids. *Triennial Review Order* ¶¶ 75, 205, 303-306. Specifically, municipalities and landlords have strong incentive to grant access to rights-of-way that they control to the “first mover” telephone carrier because these entities clearly want telephone services to be provided to their residents. Indeed, one can hardly imagine a municipality or landlord attracting any residents at all if telephone services were not available there. On the other hand, as the Commission confirmed in its *Triennial Review Order*, municipalities and landlords have little incentive to offer the same favorable terms to second-mover competitive carriers, and instead insist that competitive carriers pay much higher rates than the incumbents for the necessary access. *Triennial Review Order* ¶¶ 205, 303-306.

81. As explained above, the point of UNE pricing is to replicate the workings of an effectively contestable/competitive local telephone market because such competition cannot be expected to develop in light of the steep entry barriers into local markets. It necessarily follows that discriminatory barriers that prevent efficient entry should *not* be included in determining UNE rates. Instead, the appropriate costs for calculating UNE rates are those that the first-mover carrier would incur in efficiently acquiring the necessary rights-of-way. And, for the reasons explained above, those costs could be expected to be relatively low, for municipalities and landlords have a powerful incentive to ensure that their residents are able to send and receive telephone calls.

82. *TELRIC Does Not Retard Efficient Investment.* The incumbent economists claim that TELRIC deters network investment by incumbents. *See, e.g., Hazlett et al. (Verizon) Decl.* ¶¶ 11-19; Kahn (Verizon) Decl. ¶ 29; NERA (BellSouth) Decl. ¶ 26. At bottom, however, this

argument is simply a repackaging of the incumbents' primary argument that TELRIC is not compensatory because incumbent carriers "in the real world" can never achieve a cost structure close to LRIC (or, correlatively, that UNE prices are "below-cost"). But for the reasons explained above, so long as TELRIC-based rates permit a return on investment that reflects the *ex ante* risks associated with investing in a fully contestable market, TELRIC is fully compensatory. *See also* Willig Decl. ¶¶ 42-44. Competition fostered by the 1996 Act also gives incumbents added incentive to improve their networks in order to avoid losing customers to new entrants. *Verizon* at 517 n.33 (it is "commonsense . . . that so long as TELRIC brings about some competition, the incumbents will continue to have incentives to invest and improve their services to hold on to their existing customer base").

83. Verizon also contends that TELRIC sends inappropriate signals to competitive carriers. According to this contention, competitive carriers should be encouraged to self-deploy their own facilities whenever they can do so more cheaply than incumbent carriers. Kahn-Tardiff (*Verizon*) Decl. ¶ 29; Shelanski (*Verizon*) Decl. ¶ 17. However, the incumbents maintain that because TELRIC is lower than the incumbents' "actual forward-looking" costs, competitive carriers will lease UNEs even when they could self-deploy their own facilities.

84. This argument suffers from several independent flaws. Foremost, whatever its theoretical merits, it has no applicability to the UNEs mandated by the Commission. In the *Triennial Review Order*, the Commission held that incumbents must provide unbundled access only to those parts of the network that could not be economically duplicated by competitive carriers because of the natural monopoly characteristics of the underlying facilities. Thus, the prices that incumbents charge for a UNE can be expected to have no impact on the ability of

competitive carriers to self-deploy that UNE. Rather, allowing incumbent carriers to charge higher prices would simply foreclose meaningful UNE-based retail competition.

85. But more fundamentally, the incumbents' simplistic notion that more "investment" is better is contrary to sound public policy – as the other incumbent economists acknowledge. *Accord*, NERA (BellSouth) Decl. ¶ 27 ("The level of UNE prices must not be viewed as a part of the regulatory toolkit for encouraging just *any* entry, even inefficient entry."); Weisman (Qwest) Decl. ¶ 18 ("The proper incentives for efficient investment in network infrastructure is critical to realizing the goals of the Telecommunications Act. Artificially high TELRIC measures could be expected to result in over-investment in facilities-based networks."). In implementing the unbundling provisions of the Act, the Commission should instead seek to establish prices for telecommunications services that (i) steer purchasers to the most efficient, least-cost suppliers of each good or service for which there is sufficient demand; (ii) guide purchasers to make efficient choices among different goods and services offered in the market; and (iii) achieve the level of cost recovery that encourages efficient levels of investment, entry and exit.

86. If competitive carriers cannot deploy facilities at the LRIC of an efficient provider, then that investment is socially wasteful. By definition, LRIC-based rates represent the economic cost of the facilities used to provide a UNE. Thus, where a competitive carrier can only deploy a facility at a cost higher than the LRIC of that facility, it is inefficient and socially wasteful for it to do so. In contrast, where a competitive carrier can secure services equivalent to those of a UNE at a cost at or below the UNE's LRIC, it is efficient for the competitive carrier to do so.

87. At the same time, one must also recognize that competitive carriers have strong incentive to deploy their own facilities whenever feasible, even if they could obtain UNEs at a lower cost. The reasons should be obvious: a competitive carrier that owns its facilities avoids dependence on its largest competitor for essential inputs.

88. This basic economic theory is supported by hard econometric evidence. Along with several colleagues, I have conducted econometric studies that measure the cross-sectional variation in the terms and conditions upon which UNEs were available in the various states in order to test the linkage between the availability of UNEs, competitive LEC activity, and incumbent LEC activity. Robert D. Willig, *et al.*, *Simulating Investment and the Telecommunications Act of 1996* (filed in CC Docket Nos. 01-338 *et seq.*, Oct. 11, 2002). Employing standard econometric procedures, these studies were able to estimate how incumbent network investment was influenced by local competition, particularly local competition that resulted from UNE-P. Overall, this evidence shows a 1% reduction in UNE-P rates corresponds with approximately a 2.1% to 2.9% increase in incumbent investment.

89. Although the incumbents economists do not challenge my prior work, the Commission in the *Triennial Review Order* did raise a number of potential objections to that analysis. First, the Commission suggested that it might be “methodologically suspect” to measure investment in the cross-section sample relative to population. *Triennial Review Order* ¶ 178 n.576. Without explaining why, the Commission concluded that a normalization by Bell operating company (“BOC”) access lines would be “more direct.” *Id.* Second, the Commission characterized some of the variables used in my econometric study, namely UNE prices, average revenue per access line and the incumbent LEC cost of investment as “not well explained,” and “subject to significant errors.” *Id.* The Commission suggested that, since the original estimation

was made without the use of a calculation method known as “robust standard errors,” that “conclusions about statistical significance could be inaccurate.” *Id.* Neither concern is well-founded.

90. The suggestion that investment should be normalized by BOC access lines because doing so is “more direct” is vague. It is not clear what economic or statistical meaning is meant to be conveyed by the phrase “more direct.” In any event, in the context of the full specification employed in our model, the suggestion is misplaced. There are good reasons to believe that normalization by population is to be preferred.

91. The economic relationship that we estimate is the relationship between the optimal rate of incumbent investment and the supply and demand forces that determine the profitability of such investment. Thus, the specification includes variables that measure in each state the share of the labor force employed in telecommunications intensive industries, the level of economic activity, growth, the initial size of the telephone-relevant capital stock in place, and the regulatory environment. The specification also includes measures of the cost (TELRIC) of new investment, revenue that can be earned per line and the level of competitive carrier activity. The normalization by population that we employed builds into the estimation the expectation that after controlling for these demand and supply forces, incumbents in a larger state (as measured by population) may be expected to make proportionally larger investments.

92. If we were to replace that normalization with the normalization suggested by the Commission (BOC lines), then the expectation built into the estimation would be that after controlling for economic factors, incumbent carriers in a state with more BOC lines should be expected to make proportionally greater investments. The Commission has itself noted, however, that, “BOC access lines as a percentage of state population vary significantly.” *Id.* To

the extent that this is true even after controlling for demand and supply factors (a possibility that is not unlikely given the variation in regulatory history across states), this variation could exert a distorting effect on the estimation process. In states that are relatively “overbuilt,” for example, the number of BOC access lines relative to population is likely to be large. In such states incumbent investment is likely to be modest because profitable opportunities are less abundant, but the normalization suggested by the Commission anticipates that incumbent investment should be larger. Likewise in states that are relatively “underbuilt,” the number of BOC access lines relative to population will be small. In these states incumbent investment may be expected to be large because profitable opportunities are more abundant, but the normalization suggested by the Commission anticipates that investment in such states will be small.

93. In short, the normalization suggested by the Commission is inconsistent with the underlying economics of the investment process that is being estimated. Employing that normalization runs the risk of distorting the estimates in a way that conceals the relationships between investment demand and its economic determinants.

94. Notwithstanding the conceptual weakness of the Commission’s suggestion, I have, along with some of the co-authors of my study, re-estimated our model using the normalization suggested by the Commission. The re-estimation creates no meaningful change in our findings. With only two minor exceptions, the estimated coefficients carry the same signs and levels of statistical significance that we reported in our white paper.<sup>7</sup>

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<sup>7</sup> The two exceptions produce only minor changes in the results. First, in the incumbent carrier reduced form equation where the dependent variable is investment to 2000, the coefficient on the labor force growth variable is significant at the 94% level instead of 95%. Second, in the incumbent carrier reduced form equation where the dependent variable is investment to 2001, the UNE price coefficient is negative and significant at the 98% level instead of 99%.

95. The Commission's concern that robust "standard errors" would reveal weaknesses of our estimation is similarly misplaced. Again, while I believe that the techniques used in my prior analysis are sound, my colleagues and I have re-estimated our model with robust standard errors. We obtain the same results with respect to the signs and statistical significance of our estimates, with only a few minor exceptions.<sup>8</sup> Combining both of the Commission's suggestions — that is, normalizing investment by lines and employing robust standard errors—produces results that do not vary in any statistically meaningful respect from those reported in my prior white paper.<sup>9</sup>

96. As noted, the incumbents make no attempt to critique this careful econometric analysis. Instead, the incumbents proffer a competing analysis by Hazlett, Havenner and Bazelon. *See Hazlett et al.*(Verizon) Decl. ¶¶ 11-19. This analysis is entitled to no weight. The Hazlett-Havenner-Brazelon declaration is a sequel to an earlier analysis submitted to the Commission. Hazlett *et al.* (Verizon) Decl. ¶ 4 & n.1. In that earlier analysis, they concluded

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<sup>8</sup> The exceptions are as follows. In the incumbent carrier reduced form equation where the dependent variable is investment to 2000, the average revenue variable is significant at the 98% level instead of 99%, but the UNE price is significant at the 99% level instead of 95%. In the ILEC reduced form equation where the dependent variable is investment to 2001, the TELRIC variable is significant at the 98% level instead of 99%. In the incumbent carrier structural form equation where the dependent variable is investment to 2000, the competitive activity variable is significant at the 99% level instead of 95%, and the average revenue variable is significant at the 94% level instead of 95%. In the incumbent carrier structural form equation where the dependent variable is investment to 2001, the significance level on the average revenue variable drops from 95% to 94%.

<sup>9</sup> Overall, the exceptions are as follows. In the incumbent carrier reduced form equation where the dependent variable is investment to 2000, the significance level on the average revenue variable drops from 99% to 97%. In the incumbent carrier reduced form equation where the dependent variable is investment to 2001, the significance level on the TELRIC variable drops from 99% to 98% and drops from 99% to 97% on the UNE price. In the incumbent carrier structural form equation where the dependent variable is investment to 2000, the significance level on the competitive carrier activity variable increases from 95% to 99%, but the significance level on the average revenue variable drops from 95% to 93%.

that, “the availability of UNE-P at TELRIC prices appeared to be having a strongly negative impact on telecommunications investment.” *Id.* ¶ 11. In the current declaration, they seek to buttress that conclusion by reviewing telephone company dividend policies and by carrying out an econometric analysis of the “stepping-stone” hypothesis that competitive carriers who will eventually build their own facilities will initially rely on network facilities provided by incumbent carriers.

97. In the view of Hazlett *et. al.*, the dividends paid by telephone companies are evidence that they lack investment opportunities. “If UNE-P, which is rapidly rising, increased the incentive of carriers to invest, dividends paid by such firms would be constrained. That is, firms would tend to re-invest their earning rather than paying them out to shareholders. . . . This is why firms with high growth potential (*i.e.*, opportunities to invest in profitable projects) tend to pay relatively smaller dividends than firms without such opportunities.” *Id.* ¶ 14. In other words, according to Hazlett *et. al.*, telephone companies, both incumbents and new entrants, must lack for investment opportunities because if such opportunities existed, then the companies could not afford to pay dividends.

98. This reasoning is flawed. Effectively, Hazlett *et al.* are assuming that the firms in question do not have access to capital markets. According to this view, investment financing from external sources is so expensive that only internal funds may profitably be used to finance even attractive projects. The opposite, of course, is true. Additionally, this point of view oversimplifies the complexities of optimal financial dividend policy by neglecting the reasons why a

firm might find it in its interests to pay dividends at the same time that it raises outside capital with which to finance new investment.<sup>10</sup>

99. In any event, the specifics of the Hazlett *et al.* submission are flawed. Turning to their econometric analysis of the “stepping stone” hypothesis, they seek to test this hypothesis by estimating a relationship in which six month and one year lagged values of UNE-P lines and the current unemployment rate are used as independent variables to explain the current level of competitive carrier lines relative to BOC lines. They conclude that the stepping stone hypothesis may be rejected because they do not find a statistically significant relationship between lagged UNE-P lines and competitive carrier lines.

100. This analysis contains a variety of errors. First, the estimated equation represents only the possibilities of a relationship between UNE-P lines and competitive lines over a six month or 12 month time span. To the extent that the transition period for competitive carriers to move from UNE-P lines to their own facilities is longer than 12 months, this estimation is incapable of capturing that relationship. In view of the legal and regulatory uncertainty that has surrounded the question of UNE pricing during the last two years, it is easy to believe that the time frame for making this transition is likely to be considerably longer than 12 months.

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<sup>10</sup> Although academics in the finance community have argued that in perfect capital markets dividend policy is irrelevant, finance textbooks generally recognize that in the the real world, firms have incentives to maintain predictable dividend policies. As Brigham, Gapenski, and Daves explain, “firms should try to establish a rational dividend policy and then stick with it. Dividend policy can be changed, but this can cause problems because such changes can inconvenience the firm’s existing stockholders, send unintended signals, and convey the impression of dividend instability, all of which can have negative implications for stock prices.” Eugene F. Brigham, Louis Gapenski, and Phillip Daves, *INTERMEDIATE FINANCIAL MANAGEMENT* 466 (1999). The notion, implicitly advocated by Hazlett *et. al.*, that companies pay dividends only when profitable investment opportunities are unavailable and suspend dividends when such opportunities do exist, flies in the face of this wisdom.

101. Most egregiously, the estimating equation employed by Hazlett *et. al.* is mis-specified because it includes no prices. In other words, Hazlett *et. al.* have based their conclusion on a model that assumes that neither the cost of UNEs, as embodied in UNE-P prices, nor the cost of facilities-based investment, as embodied in TELRIC, plays any role in determining the level of facilities-based competitive carrier investment. This is a fundamental economic error, and one that my own econometric results demonstrate empirically to be important. It is elementary econometrics that this kind of omission imparts a bias to the estimates of the remaining coefficients. On this basis alone, the results obtained from the regression work of Hazlett *et. al.* are too unreliable to be credited.

102. *TELRIC Is Not Too Hypothetical To Be Reasonably Implemented.* Lastly, the incumbent economists retreat to their shop-worn claims that, whatever its theoretical merits, LRIC-based pricing is too “hypothetical” to be implemented in practice and results in widely varying cost estimates. Aaron-Rogerson (SBC) Decl. at 35-38; Eisenach-Mrozek (USTA) Decl. ¶¶ 3-5; Shelanski (Verizon) Decl. ¶ 19. In accompanying reply declarations, AT&T witnesses testify that there are no accurate factual predicates for this argument. John Klick testifies in his reply declaration that, while there have been variations in the rates determined by state commissions, these variations are largely the result of relevant cost differences between those states. Further, John Klick testifies that in many cases the “variance” alleged by the incumbents is the result of inconsistent positions taken by the incumbents themselves. In his reply declaration, Dr. Selwyn testifies that the Aron-Rogerson and Eisenach-Mrozek “regression” analyses are based on statistical techniques that are fundamentally flawed.

103. To be sure, there have been differences of opinion and some outright errors by state commissions in applying TELRIC (both upwards and downwards), but that too is inherent

in a federal regulatory scheme that allocates decision-making authority among the state commissions. As long as each state commission has authority to set UNE prices within its jurisdiction, differences in cost findings are apt to occur regardless of the particular costing methodology the Commission mandates. As Mr. Klick shows in his reply declaration, as the state commissions have gained experience with TELRIC, the variations in methodology across the country have been reduced. In the earliest TELRIC rate proceedings, state commissions did produce widely divergent rates; indeed, some states adopted absurdly high rates for certain UNEs. In this regard, I understand that as state commissions have learned from their own experience and from other states, UNE rates (adjusted for cost differences) are converging in a more narrow range, and UNE-based entry has increased markedly over the last two or three years as a result.

104. The reason why TELRIC has not generated widely varying (cost-adjusted) rates is that, as explained by AT&T's witnesses that have working experience implementing TELRIC, current TELRIC models accurately incorporate the real-world variables that are relevant to determining the economic costs of providing telephone service. Although TELRIC may disregard the incumbents' "existing" network design and operational practices, it does not ignore relevant exogenous constraints such as routing and topography. Bryant Essay at 11. The increasingly precise identification of customer locations has also increased the realism with which models account for natural geographic obstacles such as rivers and mountains. Modern TELRIC models that rely on detailed customer location data automatically account to some extent for natural obstacles to building telephone plant. Moreover, in each cluster (and where plant must be placed to connect clusters), the cost models expressly incorporate highly detailed

data regarding local soil conditions (rock, sandy, dirt), water table depths, and other terrain characteristics that affect the cost of building and installing telephone plant. Klick Decl. ¶ 57.

105. In contrast, the reproduction cost standard would be intrinsically more difficult to apply. A methodology relying more on the incumbent's "actual" network would require an exponential increase in the amount of discovery necessary from the incumbents. But even this would be unavailing. As Mr. Klick explained at length in his initial declaration, plant records are not maintained in generally consistent formats by the incumbents. Some localities may have electronic records and maps, others may have only hard copies in idiosyncratic formats. Further, as noted above, there is evidence that the incumbents' book costs are inflated by listings of investment in equipment that is not currently even to be found at the location stated in the incumbent's plant records. Moreover, network element rates must reflect the different costs in zones having different population densities and terrain, but, as the Commission has previously recognized, the incumbents' books provide investment figures only on a statewide basis for broad categories of network and other equipment. *See, e.g., Universal Service Order* ¶¶ 226, 232. Therefore, accurate UNE rates would require either extensive discovery to determine the incumbents' costs on a sufficiently disaggregated and local basis, or would require inherently arbitrary allocations of statewide costs.

106. The discovery necessary to develop accurate information about the incumbents' "actual" networks would increase the complexity of TELRIC rate proceedings enormously. As noted above, incumbents are in sole possession of much of the relevant evidence concerning their networks, and experience has starkly confirmed that no state commission could accept incumbent representations about their networks at face value. It is notoriously difficult, however, to extract the necessary information from the unwilling incumbents. The Supreme

Court expressly recognized this difficulty with alternatives to TELRIC: “[t]o the extent that the traditional public-utility model generally relied on embedded costs, similar sorts of complexity were exacerbated by an asymmetry of information, much to the utilities’ benefit.” *Verizon*, 535 U.S. at 522 (emphasis added); *see id.* (reliance on the incumbent’s network would “preserve home-field advantages for the incumbents”). One of the principal benefits of TELRIC is that it reduces these administrative difficulties

#### **IV. THE INCUMBENTS’ PROPOSED CAPITAL COST “ADDITIVES” ARE CONTRARY TO SOUND ECONOMICS.**

107. Given their concession that so long as TELRIC-based rates include an appropriate risk-adjusted cost of capital, the resulting UNE rates will be fully compensatory, the incumbents go to great lengths to argue that the existing techniques used to calculate capital costs are deficient. But the existing techniques used to compute the cost of capital are well established and known to provide accurate cost of capital estimates – indeed, they are the same techniques that have long been used by regulators and financial economists. In an accompanying reply declaration, Terry Murray testifies on technical aspects of the alternative methodologies proposed by the incumbents and the flaws found in those methodologies. Terry Murray proceeds to testify on the analytical techniques found to be appropriate for computing the cost of capital.

108. In this section, I focus on two conceptual issues. The first concerns the incumbents’ claims regarding the relevant “proxy” group of firms for estimating the cost of capital. The second concerns the incumbents’ claims that any cost of capital estimates should be “grossed up” to account for various types of risks and forgone options that they claim to be aware of, but that they claim today’s capital markets have ignored. In each instance, the incumbents’ advocacy is contrary to sound economics.

**A. The Relevant Proxy Group.**

109. Whether state commissions employ the discounted cash flow (“DCF”) technique or the capital asset pricing model (“CAPM”) for determining capital costs, they must base their calculation of available market data from a “proxy group” of companies that bear a risk profile comparable to the risks of the entity at issue here: an efficient provider of UNEs. I understand that state commissions generally use the regional Bell operating companies as the proxy group in such calculations. In their comments, some of the incumbents challenge this proxy group. *But see* SBC at 45 (“SBC submits that ILEC holding companies are a fair – indeed, conservative – proxy group to use in estimating the cost of equity”).

110. The incumbents argue that the goal of the cost of capital calculation should be to assess the risks of a firm that provides *only* UNEs, or only the UNE component of a multi-product firm. *E.g.*, Vander Weide (Verizon) Decl. ¶ 44. And the incumbents claim that using the regional Bell holding companies as the proxy group substantially understates the risk of such a business because regional Bell holding companies are able to reduce risk below that of the UNE-only portion of their business by diversifying into other lines of business. The Bells’ argument is economically flawed.

111. As a preliminary matter, it is not at all clear that diversification has made the regional Bell holding companies less risky than would be a UNE-only company. While diversification of a portfolio can decrease risk, it is not necessarily true that the portfolio is less risky than each of its components. For instance, a portfolio that holds a risk free asset, say a three month Treasury bill, and that also holds a high-tech stock, may be less risky than the high-tech stock alone, but certainly would not be less risky than the three month T-bill alone. So too here, the fact that the regional Bell holding company is diversified does not mean that it has

lower risk than each of the components of the holding company. Indeed, as other witnesses have noted, many of the other lines of business engaged in by the regional Bell holding companies are apt to be considerably riskier than the supply of UNEs. Thus, using the incumbents' networks to estimate the cost of capital might well result in a conservatively *high* estimate of the cost of capital. That problem can be addressed by state commissions to the extent that they are able to identify and make adjustments for those disparities in risk when computing the cost of capital.

112. But even if the incumbents are correct that the "diversification" undertaken by the regional Bell holding companies lowered risk, that only indicates that the correct proxy for an efficient UNE provider is a firm with the structure of a regional Bell holding company. Basic economics teaches that an efficient firm will take full advantage of all available efficiency opportunities, including economies of scale and scope. An efficient UNE provider, therefore, will size its network to account optimally for scale economies, and will take advantage of any additional efficiencies associated with economies of scope by integrating with a firm that deploys and sells, at efficient levels, products and services that are related to the sale of UNEs. In telecommunications markets, these additional sales potentially include retail services, long distance services, broadband services, maintenance services, retail and wholesale customer services, and so on. On the other hand, failing to recognize these economies of scale and scope would inflate the costs of selling UNEs, because it would ignore the economic fact that a carrier that has deployed facilities to serve an entire geographic area can spread its costs over additional customers in that area who are willing to purchase other services that can be provided over those UNEs, rather than only the limited subset of UNE customers and the limited subset of UNE services.

113. This analysis is consistent with the *Triennial Review Order*. There, the Commission stated that it would determine whether a carrier is “impaired” in its ability to self-deploy a UNE by examining “the availability of scale and scope economies gained by providing multiple services to large groups of customers” using that UNE. *Triennial Review Order* ¶ 115; *see also id.* ¶ 519 (“The state must also consider the revenues a competitor is likely to obtain from using its facilities for providing data and long distance services and from serving business customers”); *id.* n.1585 (the impairment analysis “will therefore take into account the scale and scope economies available to carriers using existing facilities to provide a variety of services to all customers that are likely to be served by an efficient entrant”). Verizon’s expert implicitly concedes this point. Vander Weide (Verizon) Decl. ¶¶ 44-47 (noting that carriers can reduce cost of capital by diversifying its assets”).

114. The proposed alternative “proxy” groups advanced by Verizon, BellSouth and Qwest are clearly less appropriate than using the regional Bell operating companies. Verizon and BellSouth advocate using the firms in the S&P 500 as a proxy for efficient providers of UNEs. But such firms plainly are not representative of an efficient UNE provider. For example, International Flavor and Fragrance is an S&P 500 company, and its primary line of business – consumer products such as fragrances and toiletries, soaps, and detergents – have little relationship to the telecommunications industry. Likewise, the market price of Exxon Mobil reflects the substantial environmental and political risks (such as outright expropriation of its assets) inherent in the petroleum business. Software companies like Oracle face the risks of products with short lifecycles and any law or court decision that changes the scope of their intellectual property rights. All of these firms, as well as most of the other 497 firms in the S&P 500 face different risk characteristics and capital requirements than an efficient provider of

UNEs. They require different capital outlays, different types of capital stock, different capital depreciation lives – indeed, different almost everything. There is no reason to think that the risks, and hence costs of capital, associated with these firms are representative of those for an efficient UNE provider. As the Wireline Competition Bureau explained in rejecting the use of the S&P 500 firms as a proxy for an efficient provider of UNEs:

The businesses of most of Verizon's S&P 500 based proxy group of companies have no obvious similarity to the provision of local exchange services, and Verizon did not describe any. Consequently, there is no basis on which to conclude that this proxy group best represents the risks that Verizon would face if faced facilities-based competition.

*Virginia Arbitration Order* 18 FCC Rcd. 17722, ¶ 90 (2003). It is thus clear that there is no justifiable basis for using the cost of capital of firms in the S&P500 as a proxy for the cost of capital of an efficient provider of UNEs.

115. Qwest's proposal to use competitive and long distance carriers as a proxy for computing the cost of capital of an efficient UNE provider also is untenable. As a preliminary matter, unlike the incumbents, competitive local carriers and long distance carriers are not in the wholesale UNE business, making them unqualified as proxies for an efficient UNE provider. Moreover, the competitive risks and current cost of capital of competitive carriers and long distance carriers are much higher than that of an efficient UNE provider carrier in a contestable market. Competitive local carriers are new entrants in markets dominated by the legacy-monopoly incumbent carriers, and have obtained only small footholds in those markets. As a result, the competitive carriers face substantial barriers to entry, and a far greater likelihood of economic losses than would efficient sellers of UNEs. Long distance carriers now face competition from the Bells, who are able to self-supply their own access at economic costs and have an established relationship with the long distance carriers' customers. For these reasons,

the cost of capital of competitive carriers and long distance carriers substantially exceed of an efficient UNE provider.

**B. Risk Premiums & Options.**

116. The incumbents argue that the existing techniques for computing the cost of capital fails to account for “special” risks faced by the incumbent. The incumbents’ identify four purported special risks: (1) competitive market risk; (2) regulatory risk; (3) lease cancellation risk; and (4) “options” or “sunk cost” risk. Pindyck (Verizon) Decl. ¶¶ 7-22; Vander Weide (Verizon) Decl. ¶¶ 8-39. As demonstrated below, these “risks” are accounted for by the current cost of capital methodologies because current methodologies are based on the expectations of financial markets, which account for such risks. Moreover, certain of the purported “risks” identified by the Bells, may actually be “upside” risks that, if separately incorporated into the cost of capital, would result in *lower* cost of capital estimates.

117. *Competitive Risk.* There can be no serious claim that the cost of capital should be grossed up to reflect additional “competitive risk.” Even Verizon’s cost of capital witness concedes that “[c]ompetitive market risk is included in estimates of the market cost of capital.” Vander Weide (Verizon) Decl. ¶ 14. That is because cost of capital estimates are based on equity prices and growth expectations as determined by financial markets, and financial markets in setting such prices and expectations account for all available and relevant information, including competition-related risk. This is true regardless of the group of firms that are used as a “proxy” to estimate the cost of capital. According to the incumbents, they face “vigorous” and “growing” competition” and so do firms in the S&P 500, and so do competitive local carriers and long distance carriers. Financial markets have thus already incorporated competitive risk factors in setting the prices and growth expectations that are used in the cost of capital models. Indeed,

investors have had nearly eight years to incorporate the financial impacts of competition into their forecasts. There is no serious evidence in this record of any need for further adjustment.

118. *Regulatory Risk.* There is obviously no need to account separately for “regulatory risk” if the incumbents are the proxy group of firms used to compute the cost of capital, because the financial markets’ prices and growth expectations used to compute the cost of capital would fully reflect such risk. Indeed, it is certainly no secret to the financial community that firms selling UNEs are subject to various regulatory requirements, including the unbundling obligations imposed by the 1996 Act, and the TELRIC pricing standard established by this Commission. The cost of capital using the incumbents as proxy firms thus fully reflects any risk associated with regulation.

119. The incumbents’ claim that regulatory risk must be added to the cost of capital is thus tied to the incumbents’ flawed claim that the cost of capital should be based on a proxy group of firms that are not involved in the sale of UNEs or, in many cases, not even involved in the telecommunications industry. The cost of capital of such firms obviously would not reflect regulatory risks in the telecommunications industry. The incumbents thus urge the commission to adjust the cost of capital upward to account for that risk. The incumbents’ arguments, however, are misguided.

120. It is important to recognize what the incumbents are actually asking the Commission to do here. The incumbents are asking the commission to identify and make adjustments to the cost of capital estimates to account for different regulatory risks associated with the group of proxy firms and the hypothetical efficient UNE provider. That is no small endeavor. It would require the Commission (or state commissions) not only to account for risks that are absent in the proxy firm industries, but also would require the *subtraction* of risks that

are present in the proxy firm industries, but absent from the telecommunications industry. As noted, the S&P 500 firms, for example, include railroads and electric utilities, each of which face substantial regulatory risks. The S&P 500 firms also include large companies that are subject to environmental regulatory risk (especially industrial companies that have been identified as polluters), safety-related regulatory risk (e.g., car manufacturers), products liability regulatory risk (e.g., tobacco and pharmaceutical manufacturers), and so on. Such risks would have to be removed from any cost of capital estimate that uses these firms as a proxy while adding any telecommunications-specific regulatory risk. It would be very poor policy, and certainly bad economics, to add telecommunications-related regulatory risk without removing these other non-telecommunications regulatory risks.

121. Even if the Commission adopted the inconsistent approach proposed by the incumbents and attempted to account for telecommunications regulatory risk without subtracting regulatory risk for the proxy companies, it is not at all clear that the telecommunications regulatory risk would, on net, increase the cost of capital. Regulation in the telecommunications industry in some cases increases the incumbents' risk, and in other cases *reduces* the incumbents' risk. As one example, the Commission oversees a universal service mechanism that is supposed to ensure that carriers serving certain "high cost" customers fully recover the cost of serving those customers, which may be on net a risk-reducing regulation.

122. *Lease Cancellation Risk.* Lease cancellation risk, as described by the incumbents, refers to the risk that a competitor may cancel a lease for unbundled network elements. As with regulatory risk, there is obviously no need to account for lease cancellation risk separately if the incumbents are the proxy group of firms used to compute the cost of capital, because the financial markets' prices and growth expectations used to compute the cost of capital would fully

reflect such risk. It is no secret to the financial community that competitors lease unbundled network elements, and that they may cancel such leases. Indeed, interconnection agreements (which contain UNE lease terms) are publicly filed; their terms and conditions are a matter of public record that the investment community can review and assess. Moreover, most other major services offered by the incumbents – including retail local service, long distance and wireless service – are also provided under contracts that allow the customer to cancel on relatively short notice, compared with the life of much of the sunk investment needed to provide the service. Indeed, because of state regulation, many incumbent retail customers have broad rights to cancel service without penalty and incumbents are often constrained in their ability to collect debts owed by their retail customers. These facts are also no secret to investors. There is no evidence against the proposition that the cost of capital using the incumbents as proxy firms thus fully reflects any risk associated with competitors' cancellation of leases.

123. The incumbents' claims that the cost of capital computations should be increased to account for lease cancellation risk is therefore, like regulatory risk, tied to the incumbents' proposal to use non-incumbent firms as a proxy when computing the cost of capital. But, as noted, such a one-sided risk adjustment for such proxy firms – compensating for telecommunications risk, but not compensating for risk that is endemic to the firms in the proxy group – must be rejected. There is simply no sound economic basis for adjusting the cost of capital computed using non-telecommunications firms as a proxy group, but not making adjustments to account for risks that are unique to the proxy firms.

124. In any event, the incumbents' claim that making their proposed one-sided risk adjustment would necessarily increase risk does not withstand scrutiny – as state commissions

that have recently been presented with these arguments have concluded.<sup>11</sup> Under the incumbents' theory, when a competitor cancels a lease, the incumbent somehow is worse off. But that is only true in two narrow circumstances: (1) where the competitor transitions the customer to non-incumbent owned facilities and (2) where the customer previously served by the competitor using the unbundled network elements becomes unprofitable even for the incumbent. In virtually all other cases, the cancellation of a UNE lease is good news for the incumbent. When the customer cancels a lease, it means that the competitor will no longer be using UNEs to serve that customer, and that the incumbent can use the facilities that were formerly leased to the competitor to sell services to that customer, thereby obtaining retail rates rather than wholesale rates for those facilities. In short, in most circumstances, lease cancellation in the realm of unbundled network elements is often beneficial to the incumbents. Any adjustments to account for lease cancellation, therefore, might well decrease, not increase, the cost of capital.

125. *Options Risk & Sunk Investment Risk.* The incumbents' proposals to add a risk premium to account for "options risk" misapplies options risk theory to TELRIC. According to the incumbents, under the current regulatory regime, incumbents must make "sunk" cost investments today to make UNEs available to competitors, commitments that eliminate the incumbents' "option" to make those investments in the future. The incumbents' argue that because the option to delay making sunk investments has a value, the incumbents' "costs" are greater than those computed using traditional cost of capital techniques. This analysis is inaccurate and incomplete.

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<sup>11</sup> Order No. 24,265, *Verizon New Hampshire Investigation Into Cost Of Capital Order Establishing Cost Of Capital*, Docket No. DT 02-110, at 42-43 (New Hampshire PSC, January 16, 2004).

126. As a preliminary matter, as noted, the current cost of capital techniques use current stock prices and financial market growth expectations to compute the cost of capital. Financial markets are, of course, fully aware of the costs associated with making sunk investments today and, therefore, the equity prices and growth expectations of the financial markets fully reflect options costs and benefits. As a result, options costs and benefits are fully reflected in the current cost of capital techniques, and no additional adjustment is necessary. In this regard, Verizon's witness, Professor Pindyck, appears to recognize that the options value may already be implicitly incorporated into the current cost of capital techniques, for he is careful to state that such "options" costs are not "*explicitly*" reflected in those models. Pindyck (Verizon) Decl. ¶ 23.

127. In any event, other well respected economists have recognized that even if an options additur were appropriately incorporated into the cost of capital, it is not clear that the additur would be positive. Indeed, it might well be zero or negative. Professor William J. Baumol, for example, found that general options theory relies on assumptions that are not valid when assessing the pricing of unbundled network elements. *See* William Baumol, *Options Value Analysis and Telephone Access Charges*, THE NEW INVESTMENT THEORY OF REAL OPTIONS AND ITS IMPLICATIONS FOR TELECOMMUNICATIONS ECONOMICS (1999). Professor Baumol explained that the incumbents' option analysis implicitly assumes that the provision of UNEs requires the incumbents to make positive net sunk investment in facilities, while that assumption is highly suspect. As articulated by Professor Baumol, "the grant to the [competitors] . . . of access to the LECs' facilities is likely to require little, if any, expanded investment commitment" because

if [competitive] . . . entry into the local telecommunications markets is successful, it will mean that the LECs will lose some of their local business to the new entrants (presumably made up for by the LEC entry into the interexchange arena). In terms of local traffic, the transfer of some traffic from LECs to the

[competitors] . . . will reduce the LECs' use of their own facilities, leaving unused capacity available for rental to the [competitors]. Thus, the entry should result in little, if any, need to expand capacity and investment. More than that – in the debates of over the proper access charges before the many regulatory agencies involved in the process, *the LECs have repeatedly contended that entry will leave them with substantial stranded assets*. But this is tantamount to saying that, far from having to *expand* capacity, the LECs expect to have considerable excess capacity left on their hands. They patently cannot have it both ways – they cannot legitimately claim at the same time that entry will force them to make substantial new investment commitments with high option-value costs, and that entry will leave them with a significant burden of excess capacity.

*Id.* at 217. Simply put, if the incumbents will not be required to make new sunk investments to provide unbundled network elements, there is no forgone option to delay such investment. Here, the incumbents have made no showing that they are required to make any appreciable new investment to justify any option premium. Moreover, where the incumbent lacks facilities or spare capacity to provide UNEs, the 1996 Act as I understand it, does not require incumbents to make the investments needed to provide the capacity. *See Triennial Review Order* ¶ 636. As Verizon has stated, “the Act does not require [it] to construct network elements . . . for the sole purpose of unbundling those elements for AT&T or other carriers.”<sup>12</sup> “Where the facility or equipment does not exist in Verizon’s network, it is not used in the provision of a telecommunications service and it’s not available for unbundling.”<sup>13</sup> Likewise, the Commission has found that, when “spare facilities and/or capacity on those facilities is unavailable, Verizon will not provide new facilities solely to complete a competitor’s order for high capacity loops.” *Pennsylvania 271 Order*, 16 FCC Rcd. 17419 ¶ 91 (2001).

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<sup>12</sup> *Application by Verizon for Authorization to Provide In-Region, InterLATA Services in State of Virginia*, FCC WC Docket No. 02-214, Ex parte letter from Ann Berkowitz, Verizon, to Marlene Dortch, FCC (Oct. 16, 2002), pp. 1-2.

<sup>13</sup> *Application by Verizon for Authorization to Provide In-Region, InterLATA Services in State of Virginia*, FCC WC Docket No. 02-214, Ex parte letter from Ann Berkowitz, Verizon, to Marlene Dortch, FCC (Oct. 1, 2002), pp. 1-2.

128. Further, even if an incumbent in fact made such investments in the past, there is no basis for recovering any forgone options costs of those investments. The costs of options foregone in the past are sunk, and thus irrelevant to forward-looking costs. In addition, the incumbent carriers have already received compensation for any past sacrifice of the option of delaying investment in local telephone facilities caused by the unbundling and interconnection obligations of the 1996 Act. In exchange for the unbundling obligations, Congress gave the incumbents affirmative and valuable rights, including the right to enter the long-distance market.

129. Finally, even assuming (counterfactually) that the incumbents were required to make UNE-specific investments on a forward-looking basis, it is not clear that the option value of that investment would increase the cost of capital. Sunk investment has at least two option-related effects. First, sunk investments eliminate the option of delaying those investments to the future, which is the “cost” identified by the incumbents. Second, sunk investments provide the incumbents with the option of building on those assets in the future, which is a “benefit” ignored by the incumbents.

130. That there are “option” benefits to making the sunk investment is intuitive. Consider a new business complex that currently lacks telephone service. The incumbent can either build facilities to that business today, or delay such deployment. By deploying telecommunications facilities to the business today, the incumbent loses the option of delaying those investments. But the incumbent also gains the “option” to deliver those services without incurring the massive additional costs associated with being the “second mover” in a market where there are substantial benefits to being the “first mover.” The incumbent also gains the “option” to deliver other services to the business, including broadband services to that customer in the future at low incremental cost. These fundamental concepts are well recognized in the

industry and by fundamental financial textbooks. See Richard Clark, *Rethinking The Implications Of "Real Options" Theory For The U.S. Local Telephone Industry*, THE NEW INVESTMENT THEORY OF REAL OPTIONS AND ITS IMPLICATIONS FOR TELECOMMUNICATIONS ECONOMICS (1999); Richard Brealey and Stewart Meyers, PRINCIPLES OF CORPORATE FINANCE, 620-22 (2000).

131. For these reasons, any addition of options values to UNE cost estimates must reflect the balance of the options cost and the options benefit. In this regard, it is important to note that the incumbents, as a technical matter, miscalculate the options benefit. The full cost of forgoing an option to invest in the future should not be attributed to UNE provision alone; rather it should be attributed across all services that become available from the investment. Accordingly, if an incumbent invests in local facilities, any options costs associated with those sunk facilities should be allocated to all retail and wholesale customers, not only to wholesale customers, as the incumbents' calculations imply.

132. The bottom line is that the incumbents' discussion of options theory is quite incomplete. The incumbents fail to recognize that the values and costs of such options are likely reflected in the data used by existing cost of capital techniques, and thus reflected in the current cost of capital estimates. Furthermore, the incumbents fail to recognize that the value of such options may, in fact, be zero or even negative, requiring a *decrease*, not an increase, in the cost of capital estimates currently used by state commissions.

**VERIFICATION PAGE**

I declare under penalty of perjury that to the best of my knowledge the foregoing  
Declaration is true and correct.

/s/ Robert D. Willig  
Robert D. Willig

Executed on: January 30, 2004